

What is claimed is:

1. An acrylic polymer bead for automobile having an average particle diameter of 0.2 to 0.5 μm , a standard deviation of particle diameter of 1 to 20 % with respect to the average particle diameter as measured with a Submicron Particle Sizer in an emulsion obtained by emulsion polymerization, and the final average particle diameter of 10 to 100 μm .

2. A method for preparing acrylic polymer beads for automobile, which beads have an average particle diameter of 0.2 to 0.5 μm and a standard deviation of particle diameter of 1 to 20 % with respect to the average particle diameter as measured with a Submicron Particle Sizer in an emulsion obtained by emulsion polymerization, the final average particle diameter after spray drying being 10 to 100 μm , the method comprising:

(a) adding an ion-exchange water, 5 to 60 wt.% of a monomer constituting a core layer, and an emulsifier to a reactor, heating the reactor, adding an aqueous initiator, and performing polymerization to form seeds;

(b) adding dropwise the rest of the monomer constituting the core layer, and further performing polymerization to form a core layer;

(c) adding a monomer constituting a shell layer, and further performing polymerization to form an emulsion containing acrylic polymer beads having a core/shell structure; and

(d) spray-drying the emulsion containing acrylic polymer beads to prepare acrylic polymer beads.

3. The method as claimed in claim 2, wherein a crosslink agent is additionally used, the crosslink agent being at least one selected from the group consisting of 1,2-ethanedioldi(meta)acrylate, 1,3-propanedioldi(meta)acrylate, 1,4-butanedioldi(meta)acrylate, 1,5-pentanedioldi(meta)acrylate, 1,6-hexanedioldi(meta)acrylate, divinylbenzene, ethyleneglycoldi(meta)acrylate, propyleneglycoldi(meta)acrylate, butyleneglycoldi(meta)acrylate, triethyleneglycoldi(meta)acrylate, polyethyleneglycoldi(meta)acrylate, polypropyleneglycoldi(meta)acrylate, polybutyleneglycoldi(meta)acrylate, and allyl(meta)acrylate.

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4. The method as claimed in claim 2, wherein a crosslink agent is additionally used in an amount of 0.1 to 3 parts by weight based on 100 parts by weight of the monomer constituting the core layer during formation of the core layer, and 0.1 to 5 parts by weight based on 100 parts by weight of the monomer constituting the shell layer during formation of the shell layer.

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5. An acrylic sol composition for automobile comprising 100 parts by weight of the acrylic polymer beads according to claim 1; 50 to 150 parts by weight of a plasticizer; and 50 to 150 parts by weight of a filler.

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6. The acrylic sol composition for automobile as claimed in claim 5, further comprising at most 10 parts by weight of at least one water absorber selected from methyltrimethoxysilane, calcium oxide, calcium chloride, silica gel and calcium hydroxide.

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7. The acrylic sol composition for automobile as claimed in claim 5, further

comprising at most 10 parts by weight of at least one adhesive agent selected from bisphenol-A epoxy, tetrabromobisphenol-A epoxy, urethane-modified epoxy, rubber-modified epoxy, trifunctional epoxy, tetrafunctional epoxy, polyfunctional bisphenol-A epoxy, phenol novolak epoxy, cresol novolak epoxy and bisphenol-A novolak epoxy.

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8. The acrylic sol composition for automobile as claimed in claim 6, further comprising at most 10 parts by weight of at least one adhesive agent selected from bisphenol-A epoxy, tetrabromobisphenol-A epoxy, urethane-modified epoxy, rubber-modified epoxy, trifunctional epoxy, tetrafunctional epoxy, polyfunctional bisphenol-A epoxy, phenol novolak epoxy, cresol novolak epoxy and bisphenol-A novolak epoxy.

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9. The acrylic sol composition for automobile as claimed in claim 5, wherein the composition has an initial viscosity of 30,000 to 80,000 cps as measured with a Brookfield Viscometer No. 7 Spindle at 20 °C and 20 rpm, and a viscosity increment of less than 30 % with respect to the initial viscosity as measured in the same conditions after 14 days of storage in a thermohydrostat (40 °C, 95 %).

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10. An acrylic sol composition for automobile comprising 100 parts by weight of the acrylic polymer beads according to claim 2; 50 to 150 parts by weight of a plasticizer; and 50 to 150 parts by weight of a filler.

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11. The acrylic sol composition for automobile as claimed in claim 10, further comprising at most 10 parts by weight of at least one water absorber selected from methyltrimethoxysilane, calcium oxide, calcium chloride, silica gel and calcium hydroxide.

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12. The acrylic sol composition for automobile as claimed in claim 10, further comprising at most 10 parts by weight of at least one adhesive agent selected from bisphenol-A epoxy, tetrabromobisphenol-A epoxy, urethane-modified epoxy, rubber-modified epoxy, trifunctional epoxy, tetrafunctional epoxy, polyfunctional bisphenol-A epoxy, phenol novolak epoxy, cresol novolak epoxy and bisphenol-A novolak epoxy.

13. The acrylic sol composition for automobile as claimed in claim 11, further comprising at most 10 parts by weight of at least one adhesive agent selected from bisphenol-A epoxy, tetrabromobisphenol-A epoxy, urethane-modified epoxy, rubber-modified epoxy, trifunctional epoxy, tetrafunctional epoxy, polyfunctional bisphenol-A epoxy, phenol novolak epoxy, cresol novolak epoxy and bisphenol-A novolak epoxy.

14. The acrylic sol composition for automobile as claimed in claim 10, wherein the composition has an initial viscosity of 30,000 to 80,000 cps as measured with a Brookfield Viscometer No. 7 Spindle at 20 °C and 20 rpm, and a viscosity increment of less than 30 % with respect to the initial viscosity as measured in the same conditions after 14 days of storage in a thermohydrostat (40 °C, 95 %).